



**Systems Analysis Laboratory**

# **Aalto Systems Forum**

## **Challenges and Opportunities for OR in Electricity Markets**

**A Public Lecture by Prof. [Shmuel S. Oren](#)**

**Department of IEOR  
and Tsinghua Berkeley Shenzhen Institute,  
University of California at Berkeley**

**Location:**

**Friday, March 6 2020 at 14-15, followed by refreshments  
Hall M1, Otakaari 1F, Aalto University, Espoo**

[Directions](#)



### **Summary**

Socio economic forces, development in generation technologies and environmental considerations have led to restructuring of the electric power systems in part of the USA and in many systems worldwide, transforming them from vertically integrated regulated monopolies to competitive market based systems. From a supply chain perspective competitive electricity markets represent, perhaps, the most challenging supply chain. The commodity is non-storable; demand is uncertain and highly correlated with weather, all the demand must be satisfied instantaneously with a high level of reliability (one day in ten years criteria for involuntary load curtailment). In addition service is provided over a network that is prone to congestion, flows over transmission lines cannot be directly controlled as in a transportation system (flows follow Kirchhoff's laws) and the market is encumbered by numerous externalities and market power. In spite of such obstacles there has been fascinating developments in the design and operations of competitive electricity markets over the last two decades through the use of state of the art optimization tools and economic principles. This talk will describe some of the key challenges in designing and operating competitive electricity markets. I will review the basic elements and alternative approaches adopted in different systems and discuss what we have learned so far in this area. I will also discuss new challenges and opportunities due to massive integration of renewable resources, proliferation of smart grid technologies and electrification of the transportation sector.

**Dr. Shmuel S. Oren** is Professor of the Graduate School and the Earl J. Isaac Chair Professor in the Department of Industrial Engineering and Operations Research at UC Berkeley. He is a co-founder and the Berkeley site director, of PSerc, a multi-university Power Systems Engineering Research Center. He has also been a member of the California ISO Market Surveillance Committee and a consultant to numerous private and public entities in the US and abroad. His Research has focused on nonlinear optimization, mechanism design, energy systems and on the design and analysis of electricity markets. He holds a B.S and M.S in Mechanical Engineering from the Technion, Israel and an M.S and Ph.D in Engineering Economic Systems from Stanford University. He is a Member of the US National Academy of Engineering, is a Life Fellow of the IEEE and Fellow of INFORMS.

## Event Registration

The event is free of charge and open for all who are interested. We would appreciate your registration to reserve the correct amount of refreshments. [Register here](#)